A. E. FLIGHT & S. M. TILTON.

CHAIN BEAMING MACHINE.

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**944,727.**

Patented Dec. 28, 1909.

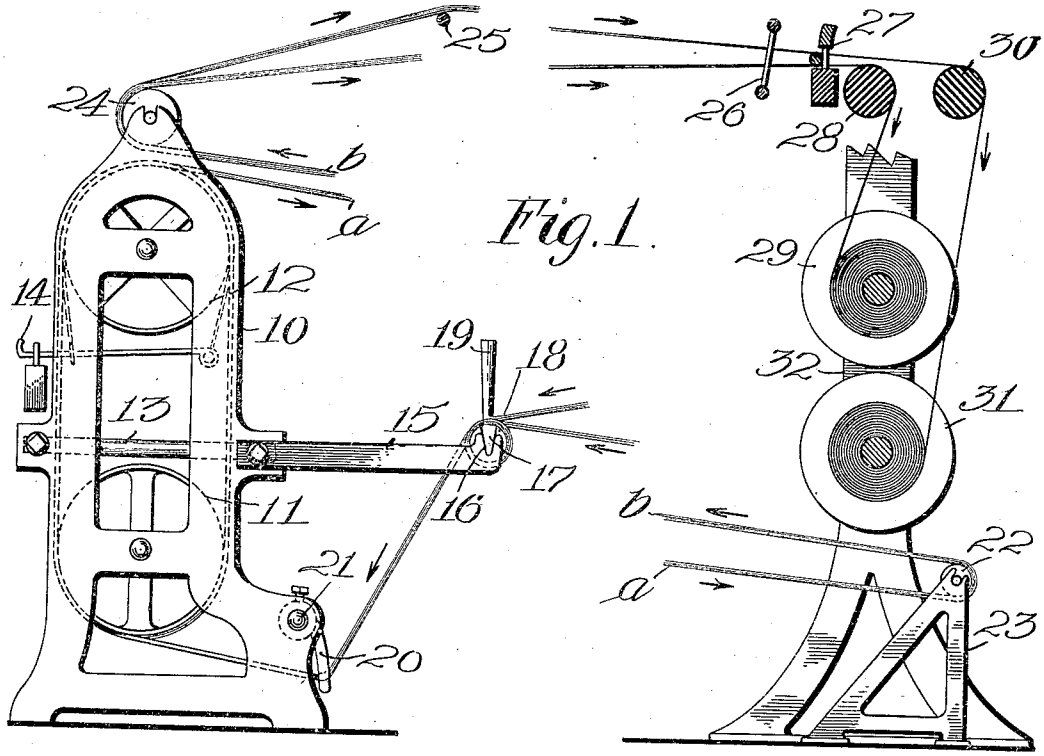



Fig. 1.

Fig. 2.

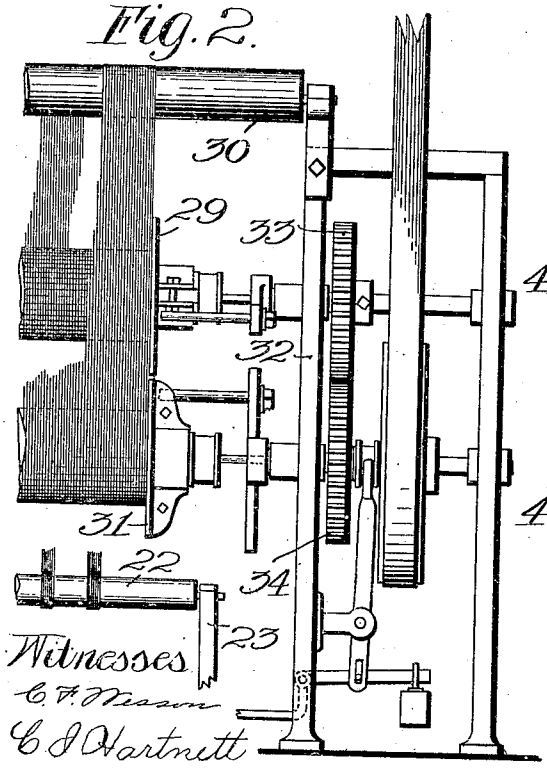
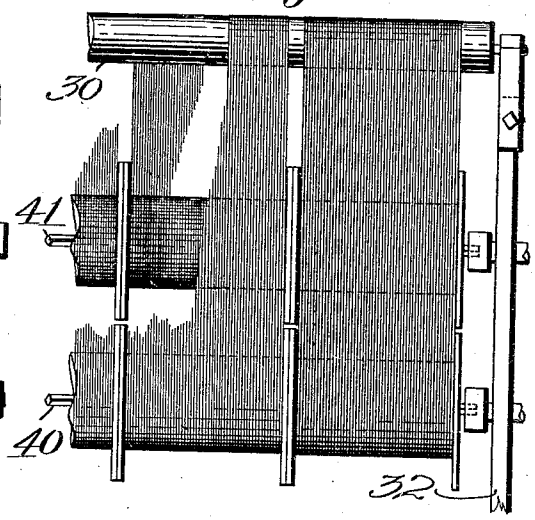



Fig. 3.




Witnesses

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# UNITED STATES PATENT OFFICE.

ALBERT E. FLIGHT AND SAMUEL M. TILTON, OF FITCHBURG, MASSACHUSETTS, ASSIGNORS TO PARKHILL MANUFACTURING COMPANY, OF FITCHBURG, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## CHAIN-BEAMING MACHINE.

944,727. Specification of Letters Patent. **Patented Dec. 28, 1909.**

Application filed April 14, 1909. Serial No. 489,797.

*To all whom it may concern:*

Be it known that we, ALBERT E. FLIGHT and SAMUEL M. TILTON, citizens of the United States, both residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented a new and useful Chain-Beaming Machine, of which the following is a specification.

This invention relates to the art of beaming or rewinding yarn which has been dyed in chains. This is one of the most difficult and unsatisfactory processes in this industry, and on account of the broken and snarled chains, slack threads, etc. which are continually met with in practice, the production is greatly reduced from the theoretical amount possible. This is due largely to the fact that considerable tension has to be used on the yarn.

The principal object of this invention is to provide a simple and extremely economical method of reducing this difficulty.

Further objects of the invention are to provide means whereby a plurality of beams can be wound simultaneously in a simple and convenient manner, thus greatly increasing production, and at the same time adding to the strength of the combined strands of yarn so as to permit the necessary tension to be used without resulting in the great number of breakages, etc. which have been encountered heretofore; and to provide improvements in the guides for the yarn and in other details of construction as will appear hereinafter.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is an elevation of a long chain beaming machine showing one embodiment of this invention applied thereto; Fig. 2 is an end elevation of a portion of the same; and Fig. 3 is a view similar to Fig. 2 showing how the same invention can be employed in winding spools.

In Figs. 1 and 2 the invention is shown as applied to a frame 10 of well known type having drums 11 and 12 thereon for receiving the chain or yarn, and provided with guides 13 on the frame between the two arms and with a tension device 14 for one of the drums. Extending horizontally from the frame at the level of the guides 13 are a pair of arms 15 having a notch 16 in their ends. In this notch rests a V-shaped projection 17 on a stationary tension rack or guide 18. This guide is provided with pins 19 which project from it so as to keep the strands of yarn separated. In practice the ends from two chains of yarn are wound one or more times around the stationary guide 18 in such a way that one of the pins keeps the chains separate. One chain of yarn is wound on one end of the guide and the other on the other, and both ends pass downwardly under a guide 20 which projects from the side of the frame and is mounted on a shaft or rod 21 extending across it. They then pass one or more times around the drums 11 and 12, each chain being kept on its proper end of these drums. They then pass from the drums at *a* on a roll 22 supported on a frame 23 as is well understood in this art. The chains then pass in strands *b* to a roll 24 on the frame 10. It will be understood that during all this time the two chains of yarn are kept under the proper tension and are guided properly to and from the several drums and rollers, one chain occupying the left side and the other the right side. The two chains at this time are also in the same plane in passing from one drum to another, but at this point the two chains are separated into two planes by a separating bar 25 which can be supported in any convenient manner. Then both of the chains are taken to a reed 26 which separates the strands and brings one chain over the other and in registration therewith, so that now each one, instead of occupying only one half of the width of the machine, extends clear across it. The chains then go through the expansion reeds 27 and the lower chain passes down over a measuring roll 28 to a warp beam 29 in a well-known way.

In addition to these elements a separating roll 30 is located about on a level with the measuring roll and beyond it for receiving the upper chain and directing it to a second warp beam 31. Both the warp beams and the rolls 28 and 30 are mounted on a frame 32. It will be understood that the warp beams may be driven in any desired way and the details of the mechanism for this purpose will not be described in detail as they are well understood in this art. But in order to provide for driving the two warp

beams in such a way that the two chains cannot come into contact or interfere with each other when the warp beams are full or empty, they are driven in opposite directions by means of gears 33 and 34 which mesh directly with each other and one of which is connected with the driving shaft. Under some circumstances, it is desired to wind this yarn on spools as is well understood, in which case this invention can be carried out by having two square shafts 40 and 41 on each of which the desired number of spools are located as indicated in Fig. 3. These shafts are driven in the same way as those shown in the first two figures, and they receive the yarn from the measuring and separating rolls respectively as indicated in Fig. 1.

It has been found in practice that this principle whether carried out with two or any other plural number of beams results in adding greatly to the strength of the combined strands of yarn, so that the yarn can be run with the tension without producing the extremely great number of breakages, snarls, etc. which have been encountered heretofore, and that the production is thus greatly increased and the machine works with great smoothness and few stoppages.

We are aware that many modifications can be made herein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore we do not wish to be limited to all the details of construction shown and described, but

What we do claim is:—

1. In a chain beaming machine, the combination of a frame, a pair of drums thereon for receiving the yarn, guides carried by the frame between said drums for separating the yarn passing around said drums, arms projecting outwardly from the frame from between the drums, and a stationary tension rack on said arms at a distance from the drums.

2. In a chain beaming machine, the combination of a frame, a pair of drums thereon for receiving the yarn, horizontal guides on the frame between said drums, a pair of horizontal arms projecting from said frame at the level of said guides, and a stationary removable tension rack mounted at the ends of said arms and having pins projecting therefrom to keep the chains of yarn separate.

3. In a chain beaming machine, the combination of a frame, a pair of drums thereon for receiving the yarn, a pair of arms projecting from said frame from between the drums, a stationary tension rack mounted on said arms, a shaft or rod extending across the frame below said arms, a guide on said shaft or rod located at a lower level than the lower drum, said guides and drums being adapted to receive two chains of yarn simultaneously.

4. In a chain beaming machine, the combination of a frame, a pair of drums thereon, guides between the drums, a guide supported by the frame at a distance in front thereof and adapted to receive two chains of yarn one on each end of the guide, and to guide it to said drums, rollers for guiding the chains of yarn from said drums and keeping said chains in the same plane, means for separating one chain from the other, a reed for spreading the strands of both chains to cause one to extend above the other throughout the width thereof, and means for receiving the two chains of yarn separately from said reed.

5. In a chain beaming machine, the combination of a set of drums adapted for receiving two chains of yarn simultaneously, one chain on each end, rollers for receiving the chains of yarn from the drums, one on each end, means for separating one chain from the other so as to be in different planes, a reed for spreading the yarn of both chains out in planes one above the other, and each of the same width, a measuring roll for receiving the lower chain of yarn, a separating roll at substantially the same level as the measuring roll for receiving the other chain of yarn, and two beams located one above the other, one for receiving each of said chains of yarn from said measuring and separating rolls respectively.

6. In a chain beaming machine, the combination of a set of drums adapted to receive a plurality of chains of yarn simultaneously, each on a different part of each drum, rollers for receiving the yarn in the same position from the drums, means for separating the chains from each other and bringing the chains into different planes, a reed for separating the strands of each chain and bringing the chains into vertical alinement with each other, a plurality of rolls one for each chain, over which the chains pass out of contact with each other, a frame on which said rolls are supported, and a plurality of warp beams mounted on said frame, one above another, one for receiving each chain.

7. In a chain beaming machine, the combination of a set of drums adapted to receive two chains of yarn simultaneously, one on each end of the drums, rollers for receiving the yarn from the drums, means for separating one chain from the other and bringing the two chains into different planes, a reed for separating the strands of each chain and bringing one chain immediately over the other, a measuring roll over which the lower chain passes, a separating roll over which the upper chain passes out of contact with the lower chain, a frame on which said

rolls are supported, warp beams mounted on said frame, one above the other, and means for rotating said warp beams in opposite directions, whereby the beams can be wound simultaneously without danger of getting into contact with each other.

In testimony whereof we have hereunto set our hands, in the presence of two subscribing witnesses.

ALBERT E. FLIGHT.
SAMUEL M. TILTON.

Witnesses:
RALPH E. THOMSON,
LEON F. JOHNSON.